Configuring BSC Transport Services

Router Software Version 11.0
Site Manager Software Version 5.0

Part No. 114077 Rev. A
August 1996

Bay Networks

Bay Networks

4401 Great America Parkway
Santa Clara, CA 95054

8 Federal Street
Billerica, MA 01821

Copyright © 1988–1996 Bay Networks, Inc.

All rights reserved. Printed in the USA. August 1996.

The information in this document is subject to change without notice. The statements, configurations, technical data, and recommendations in this document are believed to be accurate and reliable, but are presented without express or implied warranty. Users must take full responsibility for their applications of any products specified in this document. The information in this document is proprietary to Bay Networks, Inc.

The software described in this document is furnished under a license agreement and may only be used in accordance with the terms of that license. A summary of the Software License is included in this document.

Restricted Rights Legend

Use, duplication, or disclosure by the United States Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.

Notice for All Other Executive Agencies

Notwithstanding any other license agreement that may pertain to, or accompany the delivery of, this computer software, the rights of the United States Government regarding its use, reproduction, and disclosure are as set forth in the Commercial Computer Software-Restricted Rights clause at FAR 52.227-19.

Trademarks of Bay Networks, Inc.

ACE, AFN, AN, BCN, BLN, BN, BNX, CN, FN, FRE, GAME, LN, Optivity, PPX, SynOptics, SynOptics Communications, Wellfleet and the Wellfleet logo are registered trademarks and ANH, ASN, Bay•SIS, BCNX, BLNX, EZ Install, EZ Internetwork, EZ LAN, PathMan, PhonePlus, Quick2Config, RouterMan, SPEX, Bay Networks, Bay Networks Press, the Bay Networks logo and the SynOptics logo are trademarks of Bay Networks, Inc.

Third-Party Trademarks

All other trademarks and registered trademarks are the property of their respective owners.

Statement of Conditions

In the interest of improving internal design, operational function, and/or reliability, Bay Networks, Inc. reserves the right to make changes to the products described in this document without notice.

Bay Networks, Inc. does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Portions of the code in this software product are Copyright © 1988, Regents of the University of California. All rights reserved. Redistribution and use in source and binary forms of such portions are permitted, provided that the above copyright notice and this paragraph are duplicated in all such forms and that any documentation, advertising materials, and other materials related to such distribution and use acknowledge that such portions of the software were developed by the University of California, Berkeley. The name of the University may not be used to endorse or promote products derived from such portions of the software without specific prior written permission.

SUCH PORTIONS OF THE SOFTWARE ARE PROVIDED “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

In addition, the program and information contained herein are licensed only pursuant to a license agreement that contains restrictions on use and disclosure (that may incorporate by reference certain limitations and notices imposed by third parties).

Bay Networks Software License

Note: This is Bay Networks basic license document. In the absence of a software license agreement specifying varying terms, this license -- or the license included with the particular product -- shall govern licensee's use of Bay Networks software.

This Software License shall govern the licensing of all software provided to licensee by Bay Networks ("Software"). Bay Networks will provide licensee with Software in machine-readable form and related documentation ("Documentation"). The Software provided under this license is proprietary to Bay Networks and to third parties from whom Bay Networks has acquired license rights. Bay Networks will not grant any Software license whatsoever, either explicitly or implicitly, except by acceptance of an order for either Software or for a Bay Networks product ("Equipment") that is packaged with Software. Each such license is subject to the following restrictions:

1. Upon delivery of the Software, Bay Networks grants to licensee a personal, nontransferable, nonexclusive license to use the Software with the Equipment with which or for which it was originally acquired, including use at any of licensee's facilities to which the Equipment may be transferred, for the useful life of the Equipment unless earlier terminated by default or cancellation. Use of the Software shall be limited to such Equipment and to such facility. Software which is licensed for use on hardware not offered by Bay Networks is not subject to restricted use on any Equipment, however, unless otherwise specified on the Documentation, each licensed copy of such Software may only be installed on one hardware item at any time.
2. Licensee may use the Software with backup Equipment only if the Equipment with which or for which it was acquired is inoperative.
3. Licensee may make a single copy of the Software (but not firmware) for safekeeping (archives) or backup purposes.
4. Licensee may modify Software (but not firmware), or combine it with other software, subject to the provision that those portions of the resulting software which incorporate Software are subject to the restrictions of this license. Licensee shall not make the resulting software available for use by any third party.
5. Neither title nor ownership to Software passes to licensee.
6. Licensee shall not provide, or otherwise make available, any Software, in whole or in part, in any form, to any third party. Third parties do not include consultants, subcontractors, or agents of licensee who have licensee's permission to use the Software at licensee's facility, and who have agreed in writing to use the Software only in accordance with the restrictions of this license.
7. Third-party owners from whom Bay Networks has acquired license rights to software that is incorporated into Bay Networks products shall have the right to enforce the provisions of this license against licensee.
8. Licensee shall not remove or obscure any copyright, patent, trademark, trade secret, or similar intellectual property or restricted rights notice within or affixed to any Software and shall reproduce and affix such notice on any backup copy of Software or copies of software resulting from modification or combination performed by licensee as permitted by this license.

Bay Networks Software License *(continued)*

9. Licensee shall not reverse assemble, reverse compile, or in any way reverse engineer the Software. [Note: For licensees in the European Community, the Software Directive dated 14 May 1991 (as may be amended from time to time) shall apply for interoperability purposes. Licensee must notify Bay Networks in writing of any such intended examination of the Software and Bay Networks may provide review and assistance.]
10. Notwithstanding any foregoing terms to the contrary, if licensee licenses the Bay Networks product "Site Manager," licensee may duplicate and install the Site Manager product as specified in the Documentation. This right is granted solely as necessary for use of Site Manager on hardware installed with licensee's network.
11. This license will automatically terminate upon improper handling of Software, such as by disclosure, or Bay Networks may terminate this license by written notice to licensee if licensee fails to comply with any of the material provisions of this license and fails to cure such failure within thirty (30) days after the receipt of written notice from Bay Networks. Upon termination of this license, licensee shall discontinue all use of the Software and return the Software and Documentation, including all copies, to Bay Networks.
12. Licensee's obligations under this license shall survive expiration or termination of this license.

Contents

Configuring BSC Transport Services

About This Guide

Audience xi
Before You Begin xi
Conventions xii
Acronyms xii
Ordering Bay Networks Publications xiii

Technical Support and Online Services

Bay Networks Customer Service xvi
Bay Networks Information Services xvii
World Wide Web xvii
Customer Service FTP xvii
Support Source CD xviii
CompuServe xviii
InfoFACTS xix
How to Get Help xix

Chapter 1
Overview of BSC Transport Services

BSC Protocol 1-1
Hosts and Control Units 1-2
Transmission of BSC Frames over TCP 1-2
Point-to-Point and Multipoint Configurations 1-3
Point-to-Point Configuration 1-4
Multipoint Configuration 1-4
Virtual Multipoint Configuration 1-5

Chapter 2
Implementation Notes

BTS Interfaces 2-1
Peer Routers 2-1
Connections to Control Units 2-2
Line Details 2-2

Chapter 3
Enabling BTS

Enabling BTS on the Router 3-2

Chapter 4
Editing BTS Parameters

Editing the BTS Interface Parameters 4-2
Assigning Peer Routers 4-3
Enabling or Disabling BTS Peer Routers 4-7
Specifying Connections to Control Units 4-8
Enabling or Disabling a Connection to a Control Unit 4-10
Editing Line Parameters 4-11
Disabling BTS 4-16
Deleting BTS from the Router 4-16
Deleting BTS Interfaces 4-16

Appendix A
Default Values for BTS Parameters

Appendix B
Control Unit Addresses

Index

Figures

Figure 1-1. Tunneling of BSC Frames 1-3
Figure 1-2. BTS Point-to-Point Configuration 1-4
Figure 1-3. BTS Multipoint Configuration 1-4
Figure 1-4. BTS Virtual Multipoint Configuration 1-5
Figure 3-1. Edit BOT Interface Window 3-2
Figure 4-1. Configuration Manager Window 4-2
Figure 4-2. BOT Interfaces Window 4-3
Figure 4-3. BOT Peer Table Configuration Window 4-4
Figure 4-4. Add BOT Peer Entry Window 4-5
Figure 4-5. BOT CU Table Configuration Window 4-9
Figure 4-6. Add BOT CU Entry Window 4-9
Figure 4-7. Edit Bisync Parameters Window 4-12

Tables

Table A-1. Interface Parameters A-1
Table A-2. Peer Entry Parameters A-1
Table A-3. Control Unit Parameters A-2
Table A-4. Line Parameters A-2
Table B-1. Device Address Table for BSC3 ..... B-1

About This Guide

This guide describes how to configure router software to transport Binary Synchronous Communication (BSC) data over a multi-protocol backbone network. The text provides the following information for BSC Transport Services (BTS):

- An overview of the protocol (Chapter 1)
- Issues to consider when implementing the protocol (Chapter 2)
- How to enable the protocol on a Bay Networks router (Chapter 3)
- How to tailor parameters to your specific requirements (Chapter 4)

Audience

This guide addresses system and network managers who have used Site Manager software to configure Bay Networks™ routers. If you have not used Site Manager software to configure Bay Networks routers, read *Using Site Manager Software* and *Configuring Routers* before you use this guide.

Before You Begin

Before using this guide, you must complete the following procedures:

1. Open a configuration file.
2. Specify router hardware if this is a local-mode configuration file. Bay Networks supports BTS on AN, ASN, and BN platforms.
3. Choose a link module. For ASN routers, select the Dual Sync or the Dual Sync/ISDN BRI network module. For BN routers, select the Octal Sync module.
4. Select the net module connector on which you want to use BTS.

You can enable BTS only on connectors labeled COM1 or COM2.

Refer to *Configuring Routers* for instructions on these procedures.

Conventions

This section describes the conventions used in this guide.

angle character (>)	Separates menu and option names in instructions. Example: Protocols > AppleTalk identifies the AppleTalk option in the Protocols menu.
bold text	Indicates text that you need to enter and command names in text. Example: Use the **dinfo** command.
italic text	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
quotation marks (“ ”)	Indicate the title of a chapter or section within a book.
`screen text`	Indicates data that appears on the screen. Example: `Set Bay Networks Trap Monitor Filters`
vertical line (|)	Indicates that you enter only one of the parts of the command. The vertical line separates choices. Do not type the vertical line when entering the command. Example: If the command syntax is **show at routes** | **nets**, you enter either **show at routes** or **show at nets**, but not both.

Acronyms

Bisync	Binary Synchronous Communication
BOT	Binary Synchronous Communication (BSC) over TCP/IP
BSC	Binary Synchronous Communication
BTS	BSC Transport Services

CTS	clear to send
CU	control unit
FEP	front end processor
RTS	request to send

Ordering Bay Networks Publications

To purchase additional copies of this document or other Bay Networks publications, order by part number from the Bay Networks Press™ at the following telephone or fax numbers:

- Telephone 1-800-845-9523
- Fax (United States/Canada) 1-800-582-8000
- Fax (International) 1-916-939-1010

You can also use these numbers to request a free catalog of Bay Networks Press product publications.

Technical Support and Online Services

To ensure comprehensive network support to our customers and partners worldwide, Bay Networks Customer Service has Technical Response Centers in key locations around the globe:

- Billerica, Massachusetts
- Santa Clara, California
- Sydney, Australia
- Tokyo, Japan
- Valbonne, France

The Technical Response Centers are connected via a redundant Frame Relay Network to a Common Problem Resolution system, enabling them to transmit and share information, and to provide live, around-the-clock support 365 days a year.

Bay Networks Information Services complement the Bay Networks Service program portfolio by giving customers and partners access to the most current technical and support information through a choice of access/retrieval means. These include the World Wide Web, CompuServe, Support Source CD, Customer Support FTP, and InfoFACTS document fax service.

Bay Networks Customer Service

If you purchased your Bay Networks product from a distributor or authorized reseller, contact that distributor's or reseller's technical support staff for assistance with installation, configuration, troubleshooting, or integration issues.

Customers can also purchase direct support from Bay Networks through a variety of service programs. As part of our PhonePlus™ program, Bay Networks Service sets the industry standard, with 24-hour, 7-days-a-week telephone support available worldwide at no extra cost. Our complete range of contract and noncontract services also includes equipment staging and integration, installation support, on-site services, and replacement parts delivery -- within approximately 4 hours.

To purchase any of the Bay Networks support programs, or if you have questions on program features, use the following numbers:

Region	Telephone Number	Fax Number
United States and Canada	1-800-2LANWAN; enter Express Routing Code (ERC) 290 when prompted (508) 436-8880 (direct)	(508) 670-8766
Europe	(33) 92-968-300	(33) 92-968-301
Asia/Pacific Region	(612) 9927-8800	(612) 9927-8800
Latin America	(407) 997-1713	(407) 997-1714

In addition, you can receive information on support programs from your local Bay Networks field sales office, or purchase Bay Networks support directly from your authorized partner.

Bay Networks Information Services

Bay Networks Information Services provide up-to-date support information as a first-line resource for network administration, expansion, and maintenance. This information is available from a variety of sources.

World Wide Web

The Bay Networks Customer Support Web Server offers a diverse library of technical documents, software agents, and other important technical information to Bay Networks customers and partners.

A special benefit for contracted customers and resellers is the ability to access the Web Server to perform Case Management. This feature enables your support staff to interact directly with the network experts in our worldwide Technical Response Centers. A registered contact with a valid Site ID can

- View a listing of support cases and determine the current status of any open case. Case history data includes severity designation, and telephone, e-mail, or other logs associated with the case.
- Customize the listing of cases according to a variety of criteria, including date, severity, status, and case ID.
- Log notes to existing open cases.
- Create new cases for rapid, efficient handling of noncritical network situations.
- Communicate directly via e-mail with the specific technical resources assigned to your case.

The Bay Networks URL is *http://www.baynetworks.com*. Customer Service is a menu item on that home page.

Customer Service FTP

Accessible via URL *ftp://support.baynetworks.com* (134.177.3.26), this site combines and organizes support files and documentation from across the Bay Networks product suite, including switching products from our Centillion™ and Xylogics® business units. Central management and sponsorship of this FTP site lets you quickly locate information on any of your Bay Networks products.

Support Source CD

This CD-ROM -- sent quarterly to all contracted customers -- is a complete Bay Networks Service troubleshooting knowledge database with an intelligent text search engine.

The Support Source CD contains extracts from our problem-tracking database; information from the Bay Networks Forum on CompuServe; comprehensive technical documentation, such as Customer Support Bulletins, Release Notes, software patches and fixes; and complete information on all Bay Networks Service programs.

You can run a single version on Macintosh Windows 3.1, Windows 95, Windows NT, DOS, or UNIX computing platforms. A Web links feature enables you to go directly from the CD to various Bay Networks Web pages.

CompuServe

For assistance with noncritical network support issues, Bay Networks Information Services maintain an active forum on CompuServe, a global bulletin-board system. This forum provides file services, technology conferences, and a message section to get assistance from other users.

The message section is monitored by Bay Networks engineers, who provide assistance wherever possible. Customers and resellers holding Bay Networks service contracts also have access to special libraries for advanced levels of support documentation and software. To take advantage of CompuServe's recently enhanced menu options, the Bay Networks Forum has been re-engineered to allow links to our Web sites and FTP sites.

We recommend the use of CompuServe Information Manager software to access these Bay Networks Information Services resources. To open an account and receive a local dial-up number in the United States, call CompuServe at 1-800-524-3388. Outside of the United States, call 1-614-529-1349, or your nearest CompuServe office. Ask for Representative No. 591. When you're on line with your CompuServe account, you can reach us with the command **GO BAYNET**.

InfoFACTS

InfoFACTS is the Bay Networks free 24-hour fax-on-demand service. This automated system has libraries of technical and product documents designed to help you manage and troubleshoot your Bay Networks products. The system responds to a fax from the caller or to a third party within minutes of being accessed.

To use InfoFACTS in the United States or Canada, call toll-free 1-800-786-3228. Outside of North America, toll calls can be made to 1-408-764-1002. In Europe, toll-free numbers are also available for contacting both InfoFACTS and CompuServe. Please check our Web page for the listing in your country.

How to Get Help

Use the following numbers to reach your Bay Networks Technical Response Center:

Technical Response Center	Telephone Number	Fax Number
Billerica, MA	1-800-2LANWAN	(508) 670-8765
Santa Clara, CA	1-800-2LANWAN	(408) 764-1188
Valbonne, France	(33) 92-968-968	(33) 92-966-998
Sydney, Australia	(612) 9927-8800	(612) 9927-8811
Tokyo, Japan	(81) 3-5402-0180	(81) 3-5402-0173

Chapter 1
Overview of BSC Transport Services

Bay Networks BSC Transport Services (BTS) support the transmission of binary synchronous communication (BSC) data over a multiprotocol backbone network. BTS operates on the Bay Networks AN, ASN, and BN routers running Software Version 11.0 or later.

IBM introduced the BSC protocol for the transmission of data between mainframes and remote devices in the 1960s. Since then, IBM and many other vendors have implemented the BSC protocol on many types of computer and devices. Using BTS, users of BSC equipment can improve their networks by

- Integrating BSC devices into an existing network of newer client/server services
- Eliminating direct BSC lines, which are expensive and often underused
- Ensuring an extremely reliable and resilient method of data transmission via TCP/IP

BSC Protocol

BSC is a synchronous link level protocol that typically operates over low-speed lines up to 19.2 Kb/s. This protocol is character-oriented and assumes 8-bit characters. It uses EBCDIC or, less commonly, ASCII and other code sets for data transmission.

There are two versions of the BSC protocol:

- BSC3, Interactive (BSC 3270)

  This version has a primary-secondary architecture, which specifies that the primary device is responsible for initiating connections and transmitting data.

- BSC1, Batch (BSC 2780/3780)

  This version allows either side to initiate the connection and transfer data.

Bay Networks currently supports the BSC3 protocol.

Hosts and Control Units

A BSC *host* is typically a mainframe computer running the BSC protocol. BSC devices communicate with hosts via *control units.* A control unit (CU) manages the BSC devices that connect to it.

Transmission of BSC Frames over TCP

Using BTS, data travels from one BSC device to the other via two routers. The *primary* router connects to the host, and the *secondary* router connects to the control units. Figure 1-1 illustrates how a BSC device uses BTS to transmit data to a BSC host.

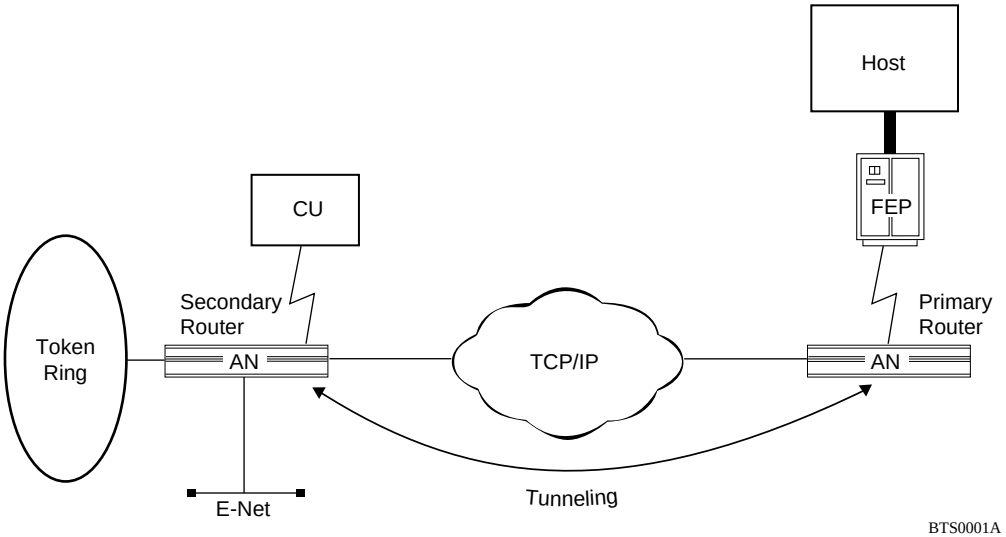

Figure 1-1. Tunneling of BSC Frames

The transfer process involves the following steps:

1. A BSC device transmits data to a secondary router.
2. The secondary router encapsulates the BSC data in a TCP/IP packet.
3. The secondary router transmits the packet over the IP network to the primary router.
4. The primary router extracts the BSC data from the TCP/IP packet.
5. The primary router transmits the BSC data to the BSC host via a front-end processor (FEP).

The process by which BSC data travels between the two routers is called *tunneling*. Tunneling is independent of protocol differences between BSC devices and hosts.

Point-to-Point and Multipoint Configurations

You can use BTS with point-to-point, multipoint, and virtual multipoint configurations.

Point-to-Point Configuration

In a BTS point-to-point configuration, one control unit and one host connect via one pair of routers (Figure 1-2).

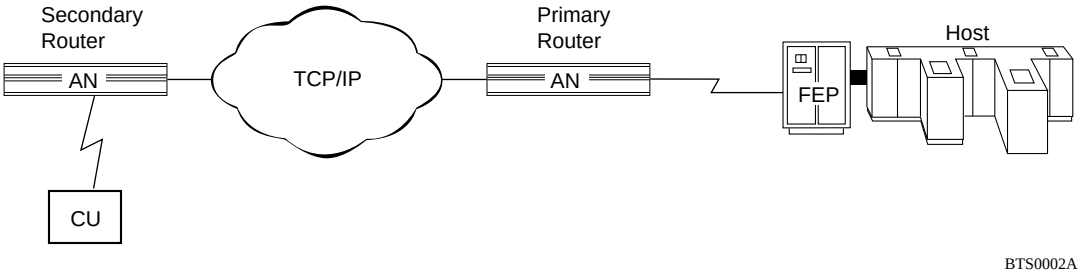

Figure 1-2. BTS Point-to-Point Configuration

Multipoint Configuration

In a BTS multipoint configuration, up to 32 control units on the same line connect to one host via one pair of routers (Figure 1-3).

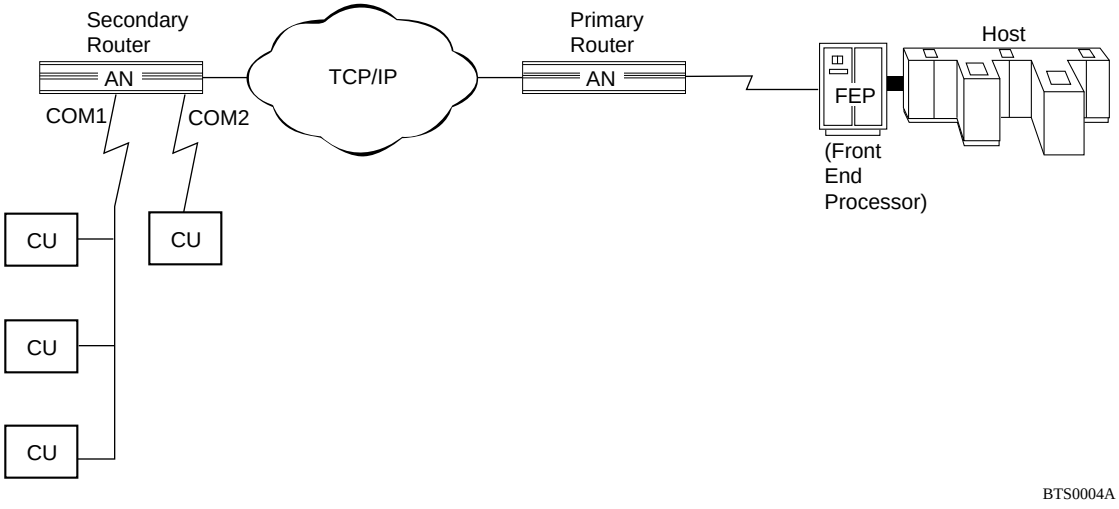

Figure 1-3. BTS Multipoint Configuration

Virtual Multipoint Configuration

In a virtual BTS multipoint configuration, control units connect to secondary routers, which link to the host via the primary router (Figure 1-4). Up to 32 control units can connect to the synchronous ports on each secondary router. Using a virtual multipoint configuration, control units at different sites can communicate with the host via the same line.

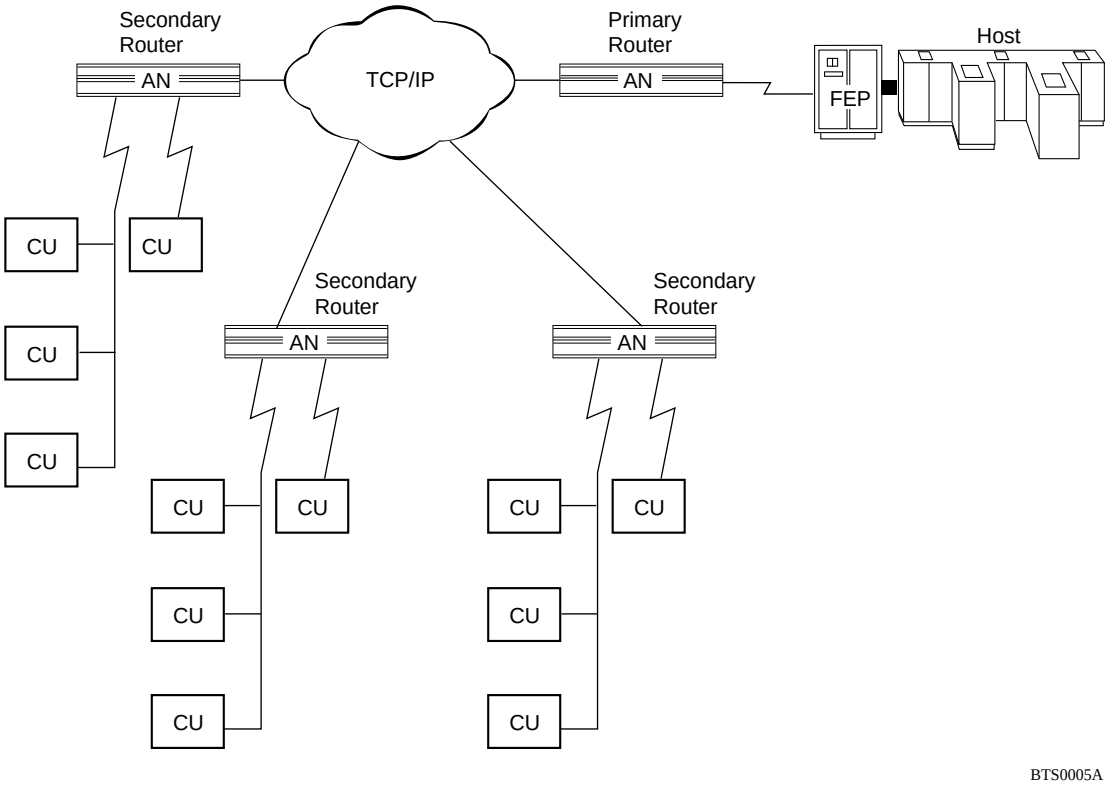

Figure 1-4. BTS Virtual Multipoint Configuration

Chapter 2
Implementation Notes

This chapter contains basic guidelines for configuring BTS interfaces.

BTS Interfaces

You can enable BTS only on COM1 or COM2 interfaces. When you enable BTS on an interface, you must specify whether the interface

- Connects to a host (primary connection) or a control unit (secondary connection)
- Uses one (point-to-point) or many (multipoint) TCP connections

  Only a primary interface can have many TCP connections.

Refer to Chapter 3 for information about enabling BTS.

Peer Routers

When you enable BTS, you must assign at least one peer router. If you set up a point-to-point BTS interface, you can assign only one peer router. If, however, you set up a multipoint BTS interface, you can assign multiple peer routers, either when you enable BTS or later.

When you assign a peer router, you must specify

- The IP address of the peer router
- Which of the two routers initiates the TCP connection
- The TCP ports the routers use for BTS

Caution: Do not specify a TCP port that you have assigned to another application (such as telnet or ftp).

You must also configure the peer router so that the information for the router pair matches. Refer to Chapter 4 for information about assigning peer routers.

Connections to Control Units

You can connect up to 32 control units on the same line that links to a secondary router. The more control units you connect to a line, the slower the performance of BTS services.

In a multipoint or virtual multipoint configuration, you must configure the BOT CU table on the primary router. This table contains the addresses of each control unit that the host can access.

You cannot configure the BOT CU table if the interface

- Connects to a control unit
- Is a point-to-point connection

For a virtual multipoint configuration, the primary router can have more than one peer router. For each peer router, you must specify the control units that the host can access.

Line Details

Configuring line details for a Bisynchronous line is similar to configuring line details for a synchronous line. In particular, you need to specify the following information:

- Maximum frame size the router can transmit on this line
- Clock source for the timing signals
- Speed of the clock source
- Control character mode (EBCDIC or ASCII)

Refer to Chapter 4 for information about configuring line details.

Chapter 3
Enabling BTS

This chapter describes how to enable BTS. It assumes you have read the *Configuring Routers* documentation and:

1. Opened a configuration file.
2. Specified router hardware, if this is a local-mode configuration file.
3. Chosen a link module.
4. Selected the connector on which you are enabling BTS.

   You can enable BTS only on COM1 or COM2 connectors.

For each BTS parameter that you configure, Chapters 3 and 4 give the default setting, all valid parameter options, the parameter function, instructions for setting the parameter, and the Management Information Base (MIB) object ID.

The Technician Interface allows you to modify parameters by issuing **set** and **commit** commands with the MIB object ID. This process is equivalent to modifying parameters using Site Manager. For more information about using the Technician Interface to access the MIB, refer to *Using Technician Interface Software*.

Caution: The Technician Interface does not verify that the value you enter for a parameter is valid. Entering an invalid value can corrupt your configuration.

Enabling BTS on the Router

When you select the net module connector on which you want to enable BTS, the WAN protocols menu appears. To enable BTS on the router:

1. **Select BOT from the WAN Protocols menu.**
2. **Click on OK.**

   The Edit BOT Interface window appears (Figure 3-1).

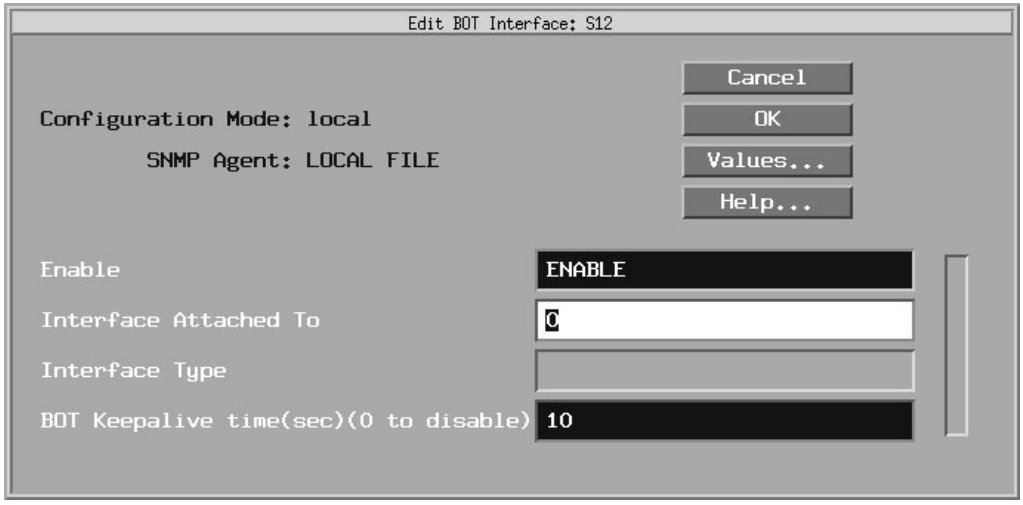

Figure 3-1. Edit BOT Interface Window

3. **Configure the parameters in this window.**

   Use the descriptions that follow as a guide.
4. **Click on OK.**

   The BOT Peer Table Configuration window appears.
5. **Proceed to "Assigning Peer Routers" in Chapter 4.**

Parameter:	**Enable**
Default:	Enable
Options:	Enable | Disable
Function:	Enables or disables BTS on this interface.
Instructions:	Select Enable or Disable.
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.2.1.2

Parameter:	**Interface Attached To**
Default:	None
Options:	Primary | Secondary
Function:	Specifies whether this interface connects to a host (primary connection) or a control unit (secondary connection). One router can have both primary and secondary interfaces.
Instructions:	Select Primary or Secondary.
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.2.1.7

Parameter:	**Interface Type**
Default:	Point to Point
Options:	Point to Point | Multipoint
Function:	Specifies whether the interface has one or many TCP connections. Point-to-point provides one TCP connection to the peer router. Multipoint provides many TCP connections to one or more peer routers. A primary interface can have either a point-to-point or multipoint connection. A secondary interface can have only a point-to-point connection.
Instructions:	If this is a primary connection, select point-to-point or multipoint; if this is a secondary connection, accept point-to-point.
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.2.1.6

Parameter:	**BOT Keepalive time (sec)**
Default:	10 seconds
Range:	0 to 2147483647 seconds
Function:	Specifies how often the router sends a signal to the peer router to check that the peer router is working correctly and can receive messages.
Instructions:	Enter a value appropriate for the network. We recommend that you – Set this parameter to the same value on the peer router to maintain synchronization – Use a value up to 50 seconds
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.2.1.9

Chapter 4
Editing BTS Parameters

This chapter provides information on how you can edit the parameters for the BTS interfaces that you configure on the router.

For each BTS parameter that you configure, Chapters 3 and 4 give the default setting, all valid parameter options, the parameter function, instructions for setting the parameter, and the Management Information Base (MIB) object ID.

The Technician Interface allows you to modify parameters by issuing **set** and **commit** commands with the MIB object ID. This process is equivalent to modifying parameters using Site Manager. For more information about using the Technician Interface to access the MIB, refer to *Using Technician Interface Software*.

Caution: The Technician Interface does not verify that the value you enter for a parameter is valid. Entering an invalid value can corrupt your configuration.

After you enable BTS, you can edit all BTS parameters from the Configuration Manager window (Figure 4-1). Refer to *Configuring Routers* for instructions on accessing this window.

Figure 4-1. Configuration Manager Window

Editing the BTS Interface Parameters

When you enable BTS, you must configure the BTS interface parameters (refer to Chapter 3). You can, however, edit these parameters later.

To edit the BTS interface parameters:

1. **Start at the Configuration Manager window (Figure 4-1).**
2. **Select Protocols > BOT > Interfaces.**

   The BOT Interfaces window (Figure 4-2) appears.

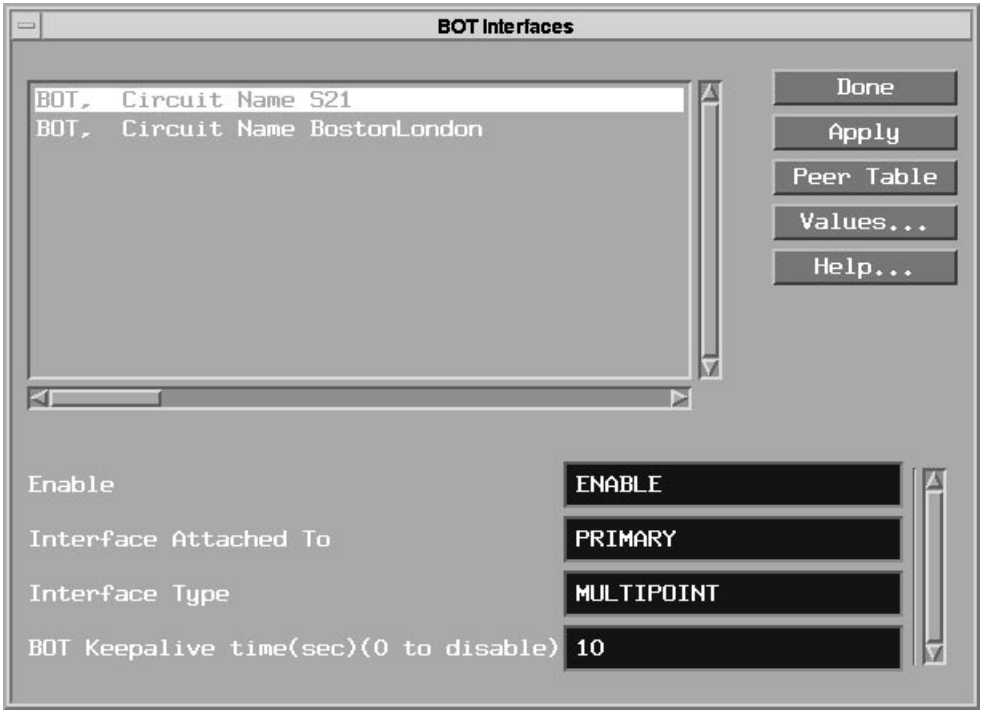

Figure 4-2. BOT Interfaces Window

3. **Select an entry in this window.**
4. **Edit the parameters in this window.**

   Refer to the descriptions in Chapter 3 for guidelines.
5. **Click on Apply.**
6. **Click on Done.**

   The Configuration Manager window returns (refer to Figure 4-1).

Assigning Peer Routers

When you enable BTS on a router, you must assign at least one peer router. If you set up a point-to-point BTS interface, you can assign only one peer router. If, however, you set up a multipoint BTS interface, you can assign multiple peer routers, either when you enable BTS or later.

Before you assign peer routers, access the BOT Peer Table Configuration window (Figure 4-3). When you enable BTS, and click on OK to exit the Edit BOT interface window (refer to Figure 3-1), the BOT Peer Table Configuration window (Figure 4-3) appears automatically.

To access this window when you want to assign additional peer routers:

1. **Start at the Configuration Manager window (Figure 4-1).**
2. **Select Protocols > BOT > Interfaces.**

   The BOT Interfaces window appears (Figure 4-2).
3. **Click on Peer Table.**

   The BOT Peer Table Configuration window appears (Figure 4-3).

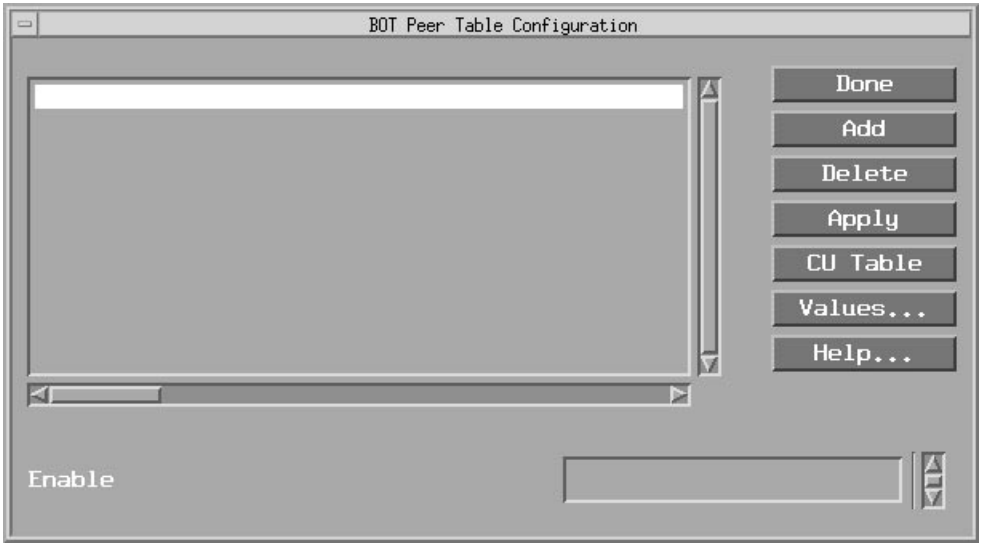

Figure 4-3. BOT Peer Table Configuration Window

To assign a peer router:

1. **Click on Add.**

   The Add BOT Peer Entry window appears.

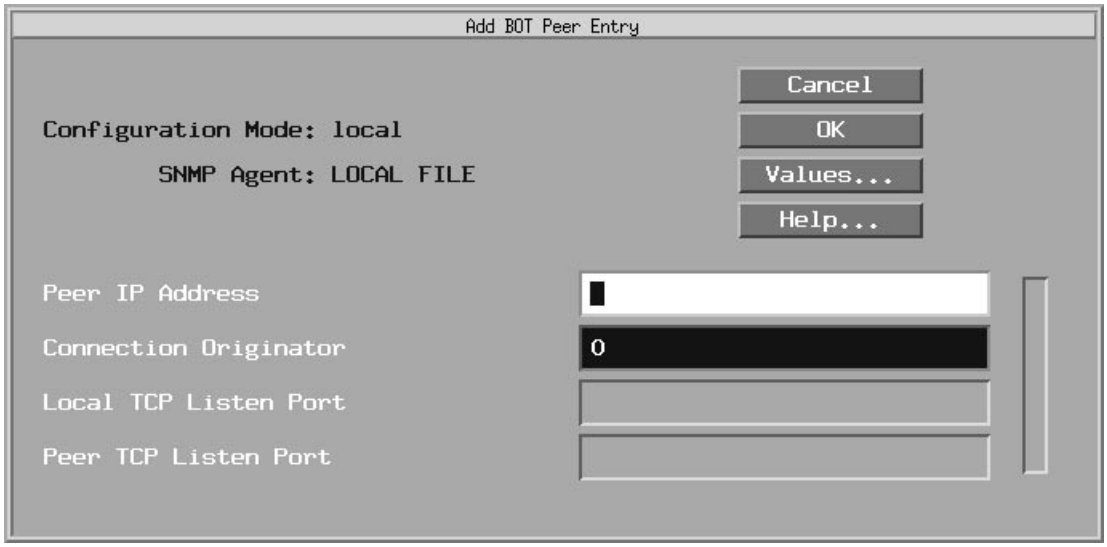

Figure 4-4. Add BOT Peer Entry Window

2. **Configure the parameters in this window.**

   Use the descriptions that follow as a guide.

3. **Click on OK.**

   The BOT Peer Table Configuration window returns (Figure 4-3), displaying the peer entry you added. When you configure a peer router, Site Manager automatically enables the TCP connection to that router. To disable a connection to a peer router later, refer to "Enabling or Disabling BTS Peer Routers," later in this chapter.

4. **Click on Apply.**

5. **Click on Done to exit this window or click on CU Table to specify a connection to a control unit.**

Note: The CU Table button does not appear when you are configuring a point-to-point circuit.

For information about specifying connections to control units, refer to "Specifying Connections to Control Units," later in this chapter.

Parameter:	**Peer IP Address**
Default:	None
Options:	Any valid IP address
Function:	Specifies the IP address of the peer router.
Instructions:	Enter the peer router's IP address in dotted decimal notation.
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.3.1.5

Parameter:	**Connection Originator**
Default:	None
Options:	Self | Partner
Function:	Determines whether this router (Self) or the peer router (Partner) initiates the TCP connection.
Instructions:	Select Self or Partner. Be sure to set this parameter on the peer router to the other value.
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.3.1.6

Parameter:	**Local TCP Listen Port**
Default:	None
Options:	Any valid port number
Function:	Specifies the TCP port number that this router uses for BTS. This parameter is active only when you set the Connection Originator parameter to Partner.
Instructions:	Enter a valid, available port number for this router. Be sure to use the same value for the Peer TCP Listen Port parameter on the peer router.
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.3.1.7

Parameter:	**Peer TCP Listen Port**
Default:	None
Options:	Any valid port number
Function:	Specifies the TCP port that the peer router uses for BTS. This parameter is active only when you set the Connection Originator parameter to Self.
Instructions:	Enter a valid, available port number for the peer router. Be sure to use the same value for the Local TCP Listen Port parameter on the peer router.
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.3.1.8

Enabling or Disabling BTS Peer Routers

When you configure a peer router, the local router automatically enables the TCP connection to the peer. To disable or re-enable the connection to a peer router:

1. **Start at the Configuration Manager window (refer to Figure 4-1).**
2. **Select Protocols > BOT > Interfaces.**

   The BOT Interfaces window appears (refer to Figure 4-2).
3. **Select an entry in this window.**
4. **Click on Peer Table.**

   The BOT Peer Table Configuration window appears (refer to Figure 4-3).
5. **Set the Enable parameter to Enable or Disable.**
6. **Click on Apply.**

7. **Click on Done in each window to return to the Configuration Manager.**

Parameter:	**Enable**
Default:	Enable
Options:	Enable | Disable
Function:	Enables or disables the TCP connection to this peer router.
Instructions:	Select Enable or Disable.
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.3.1.2

Specifying Connections to Control Units

In a multipoint or virtual multipoint configuration, you must configure the BOT CU table on the primary router. This table contains the addresses of each control unit that the host can access.

You cannot configure the BOT CU table if the interface

- Connects to a control unit
- Is a point-to-point connection

In a virtual multipoint configuration, the primary router can have more than one peer router. Each peer router has a corresponding entry in the BOT Peer Table Configuration window (refer to Figure 4-3). For each entry, you must specify the control units that the host can access.

To specify connections to control units:

1. **Start at the BOT Peer Table Configuration window (refer to Figure 4-3).**
2. **Select a peer entry in the window.**
3. **Click on CU Table.**

   The BOT CU Table Configuration window appears (Figure 4-5).

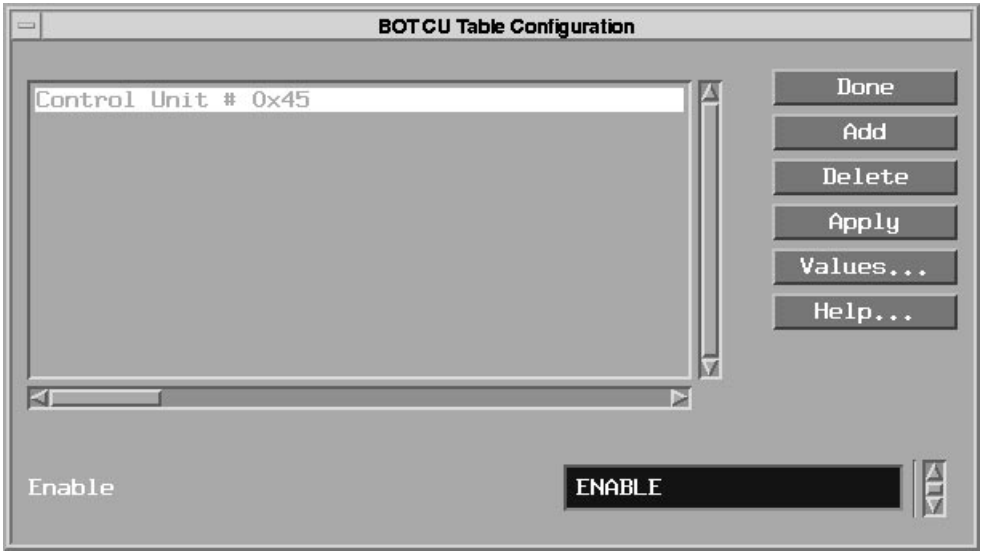

Figure 4-5. BOT CU Table Configuration Window

4. **Click on Add.**

   The Add BOT CU Entry window appears (Figure 4-6).

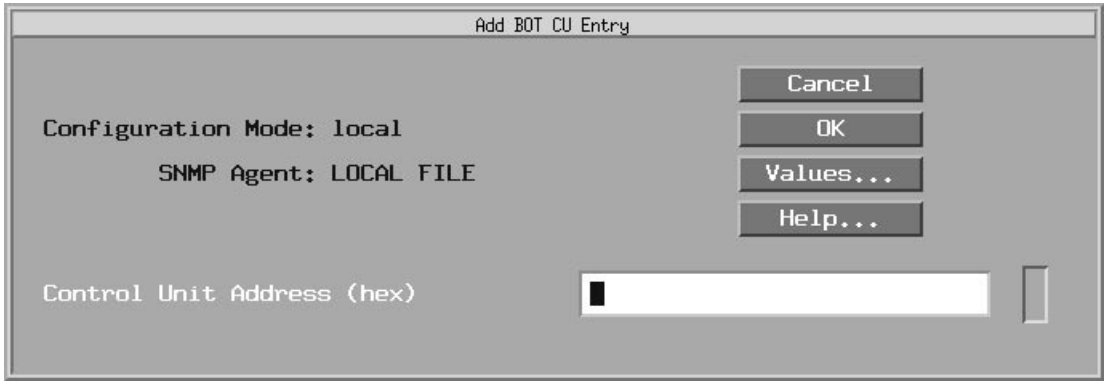

Figure 4-6. Add BOT CU Entry Window

5. **Enter the address of the control unit.**

   Refer to the following description and Appendix B for guidelines.

6. **Click on OK.**

   The BOT CU Table Configuration window returns (refer to Figure 4-5). When you add an entry to the BOT CU Table, Site Manager automatically enables the TCP connection to that control unit. To disable the connection later, refer to "Enabling or Disabling a Connection to a Control Unit," later in this chapter.

7. **Click on Apply.**

8. **Click on Done.**

Parameter:	**Control Unit Address**
Default:	None
Range:	0x40 to 0xfe
Function:	Specifies the address of the control unit.
Instructions:	Enter the address of the control unit, in hexadecimal format.
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.3.1.8

Enabling or Disabling a Connection to a Control Unit

When you add an entry to the BOT CU Table, the router automatically enables the TCP connection to that control unit. To disable or re-enable the connection to a control unit:

1. **Start at the BOT Peer Table Configuration window (refer to Figure 4-3).**

2. **Select the appropriate peer entry for the control unit.**

3. **Click on CU Table.**

   The BOT CU Table Configuration window appears (refer to Figure 4-5).

4. **Select a control unit from the list of entries.**

5. **Set the Enable parameter to Enable or Disable.**

   Refer to the following description for guidelines.

6. **Click on Apply to save your change.**

7. **Click on Done.**

Parameter:	**Enable**
Default:	Enable
Options:	Enable | Disable
Function:	Specifies whether or not the TCP connection to this control unit is active.
Instructions:	Select Enable or Disable.
MIB Object ID:	1.3.6.1.4.1.18.3.5.18.3.1.2

Editing Line Parameters

To edit the line-specific parameters:

1. **Start at the Configuration Manager window (refer to Figure 4-1).**
2. **Click on the appropriate connector.**

   The Edit Connector window appears.
3. **Click Edit Line.**

   The Edit Bisync Parameters window appears (Figure 4-7).

Figure 4-7. Edit Bisync Parameters Window

4. **Configure the line parameters.**

   Refer to the following descriptions for guidelines.

5. **Click on OK to save your changes.**

   The Edit Connector window returns.

6. **Click on Done.**

Parameter:	**Enable**
Default:	Enable
Options:	Enable | Disable
Function:	Enables or disables this line.
Instructions:	Select Enable or Disable.
MIB Object ID:	1.3.6.1.4.1.18.3.4.27.1.1.2

Parameter:	**MTU Size**
Default:	1580
Range:	1 to 4568 bytes
Function:	Specifies the largest frame that the router can transmit across this Bisynchronous line.
Instructions:	Specify a value appropriate for the network.
MIB Object ID:	1.3.6.1.4.1.18.3.4.27.1.1.4

Parameter:	**Clock Source**
Default:	External
Options:	External | Internal
Function:	Specifies the origin of the Bisynchronous timing signals. If you set this parameter to Internal, this router supplies the required timing signals. If you set this parameter to External, an external network device supplies the required timing signals.
Instructions:	Select the clocking mode, as appropriate for the network. Be sure to attach the appropriate cable to your router for an internal or external clocking source (see *Cable Guide for Routers and BNX Platforms*).
MIB Object ID:	1.3.6.1.4.1.18.3.4.27.1.1.7

Parameter:	**Clock Speed**
Default:	9600
Options:	1200 B | 2400 B | 4800 B | 7200 B | 9600 B | 19200 B
Function:	Sets the clock speed when you use the router to supply clocking signals. Depending on the protocols you configured on this interface, this value may control internal decision making within the router. In some cases, the router uses this value for selecting routes.
Instructions:	Set the clock speed to the desired data transmission rate across the Bisynchronous line, and set the Clock Source parameter to Internal.
MIB Object ID:	1.3.6.1.4.1.18.3.4.27.1.1.8

Parameter:	**Configured Transmit Q Length**
Default:	0
Range:	0 to 255
Function:	Specifies the length of the transmit queue. If you set this parameter to zero, the router selects an appropriate value; otherwise, the router uses the length you specify. If you enter a value that is larger than the number of buffers the router reserves for transmitting data (the compiled ring size), the router reduces the value to the compiled ring size.
Instructions:	Accept the default or enter a value that is appropriate for this line.
MIB Object ID:	1.3.6.1.4.1.18.3.4.27.1.1.10

Parameter:	**Configured Receive Q Length**
Default:	0
Range:	0 to 255
Function:	Specifies the length of the receive queue. If you set this parameter to zero, the router selects an appropriate value; otherwise, the router uses the length you specify. If you enter a value that is larger than the number of buffers the router reserves for receiving data (the compiled ring size), the router reduces the value to the compiled ring size.
Instructions:	Accept the default or enter a value that is appropriate for this line.
MIB Object ID:	1.3.6.1.4.1.18.3.4.27.1.1.11

Parameter:	**Control Character Mode**
Default:	EBCDIC
Options:	EBCDIC | ASCII
Function:	Specifies the code set that the Bisynchronous Communication Protocol uses. The Bisync link layers use control characters to identify frames. EBCDIC is more common than ASCII.
Instructions:	Select EBCDIC or ASCII.
MIB Object ID:	1.3.6.1.4.1.18.3.4.27.1.1.12

Parameter:	**RTS Enable**
Default:	Disabled
Options:	Enabled | Disabled
Function:	Enables or disables the detection of request to send (RTS) and clear to send (CTS) signals on this interface.
Instructions:	Set this parameter to Enable if the connected device (for example, a modem) uses RTS/CTS flow control.
MIB Object ID:	1.3.6.1.4.1.18.3.4.27.1.1.14

Parameter:	**External Clock Speed**
Range:	9600
Options:	1200 to 19200 bits/s
Function:	Sets the clock speed when you use an external source to supply clocking signals. Depending on the protocols you configured on this interface, this value may control internal decision making within the router. In some cases, the router uses this value for selecting routes.
Instructions:	Enter the value that most closely corresponds to the speed of the external clock, and set the Clock Source parameter to External.
MIB Object ID:	1.3.6.1.4.1.18.3.4.27.1.1.15

Disabling BTS

To disable BTS globally without deleting it from the router:

1. **Start at the Configuration Manager window (Figure 4-1).**
2. **Select Protocols > BOT > Global.**

   The Edit BOT Global Parameters window appears.
3. **Set the Enable parameter to Disable.**
4. **Click on OK.**

Deleting BTS from the Router

To delete BTS from the router:

1. **From the Configuration Manager window (Figure 4-1), select Protocols > BOT > Delete BOT.**

   A window appears, displaying the message:

```
Do you REALLY want to delete BOT?
```

2. **Click on OK.**

   The Configuration Manager window returns (Figure 4-1). BTS is no longer operating on the router.

Deleting BTS Interfaces

To delete a specific BTS interface:

1. **Start at the Configuration Manager window (refer to Figure 4-1).**
2. **Select Circuits > Delete Circuit.**

   The Circuit List window appears.
3. **Select the interface you want to delete.**
4. **Click on Delete.**

   The Delete circuit window appears.
5. **Click on Delete.**

Appendix A
Default Values for BTS Parameters

Tables A-1 through A-4 list the Site Manager default parameter settings for BTS.

Table A-1. Interface Parameters

Parameter	Default
Enable	Enable
Interface Attached To	None
Interface Type	Point-to-Point
BOT Keepalive time (sec)	10 seconds

Table A-2. Peer Entry Parameters

Parameter	Default
Peer IP Address	None
Connection Originator	None
Local TCP Listen Port	None
Peer TCP Listen Port	None
Enable	Enable

Table A-3. Control Unit Parameters

Parameter	Default
Control Unit Address	None
Enable	Enable

Table A-4. Line Parameters

Parameter	Default
Enable	Enable
MTU Size	1580
Clock Source	External
Clock Speed	9600
Configured Transmit Q Length	0
Configured Receive Q Length	0
Control Character Mode	EBCDIC
RTS Enable	Disabled
External Clock Speed	9600

Appendix B
Control Unit Addresses

When you specify connections to control units (refer to Chapter 4), you must supply the appropriate address of the control unit. Table B-1 shows the addresses you should use for BSC3.

Table B-1. Device Address Table for BSC3

Control Unit or Device Position	Control Unit Address
0	0x40
1	0xC1
2	0xC2
3	0xC3
4	0xC4
5	0xC5
6	0xC6
7	0xC7
8	0xC8
9	0xC9
10	0x4A
11	0x4B
12	0x4C
13	0x4D
14	0x4E
15	0x4F

Table B-1. Device Address Table for BSC3

Control Unit or Device Position	Control Unit Address
	(continued)
16	0x50
17	0xD1
18	0xD2
19	0xD3
20	0xD4
21	0xD5
22	0xD6
23	0xD7
24	0xD8
25	0xD9
26	0x5A
27	0x5B
28	0x5C
29	0x5D
30	0x5E
31	0x5F

Index

A

assigning peer routers, 2-1, 4-3

B

Bay Networks
- CompuServe forum, xviii
- Customer Service FTP, xvii
- home page on World Wide Web, xvii
- InfoFACTS service, xix
- publications, ordering, xiii
- support programs, xvi
- Support Source CD, xviii
- Technical Response Center, xv, xix
- technical support, xv

BOT
- interface parameters
  - BOT Keepalive time (sec), 3-4
  - default values, A-1
  - editing, 4-2
  - Enable, 3-3
  - Interface Attached To, 3-3
  - Interface Type, 3-3

BOT Keepalive time (sec) parameter, 3-4

BSC
- host, 1-2
- protocol, 1-1

BSC1 overview, 1-2

BSC3 overview, 1-2

BTS
- deleting from a router, 4-16
- disabling, 4-16
- enabling, 2-1, 3-1
- interfaces, deleting, 4-16
- supported routers, xi

C

Clock Source parameter, 4-13

Clock Speed parameter, 4-14

CompuServe, Bay Networks forum on, xviii

Configured Receive Q Length parameter, 4-14

Configured Transmit Q Length parameter, 4-14

configuring the BTS Peer Table, 3-4

Connection Originator parameter, 4-6

connections to control units
- disabling, 4-10
- enabling, 4-10
- specifying, 2-2, 4-8, B-1

Control Character Mode parameter, 4-15

Control Unit Address parameter, 4-10

control unit parameters
- Control Unit Address, 4-10
- default values, A-2
- Enable, 4-11

control units, 1-2
- addresses, B-1

Customer Service FTP, xvii

customer support. *See* getting help

D

deleting
- BTS from a router, 4-16
- BTS interfaces, 4-16

disabling
- a Bisync line, 4-13
- BTS, 4-16

connections to control units, 4-10
connections to peer routers, 4-7
Dual Sync module, xi
Dual Sync/ISDN BRI module, xi

E

editing
BOT interface parameters, 4-2
line parameters, 4-11
Enable parameter
for BTS, 3-3
for control unit, 4-11
for line, 4-13
for peer entry, 4-8
enabling
a Bisync line, 4-13
BTS, 2-1, 3-1
connections to control units, 4-10
connections to peer routers, 4-7
External Clock Speed parameter, 4-15

G

getting help
from a Bay Networks Technical Response Center, xix
from the Support Source CD, xviii
through CompuServe, xviii
through Customer Service FTP, xvii
through InfoFACTS service, xix
through World Wide Web, xvii

H

host, BSC, 1-2

I

implementation notes, 2-1
InfoFACTS service, xix
Interface Attached To parameter, 3-3
Interface Type parameter, 3-3

L

line details, 2-2
line parameters
Clock Source, 4-13
Clock Speed, 4-14
Configured Receive Q Length, 4-14
Configured Transmit Q Length, 4-14
Control Character Mode, 4-15
default values, A-2
editing, 4-11
Enable, 4-13
External Clock Speed, 4-15
MTU Size, 4-13
RTS Enable, 4-15
Local TCP Listen Port parameter, 4-7

M

MTU Size parameter, 4-13
multipoint configuration, 1-4, 2-2, 4-8

O

overview of BSC Transport Services (BTS), 1-1

P

peer entry parameters
Connection Originator, 4-6
default values, A-1
Enable, 4-8
Local TCP Listen Port, 4-7
Peer IP Address, 4-6
Peer TCP Listen Port, 4-7
Peer IP Address parameter, 4-6
peer routers, assigning, 2-1, 4-3
Peer TCP Listen Port parameter, 4-7
point-to-point configuration, 1-4
primary router, 1-2

R

router
primary, 1-2
secondary, 1-2
RTS Enable parameter, 4-15

S

secondary router, 1-2
specifying connections to control units, 2-2, 4-8
Support Source CD, xviii

T

Technician Interface, 3-1, 4-1
Transmission of BSC frames over TCP, 1-2
tunneling, 1-3

V

virtual multipoint configuration, 1-5, 2-2, 4-8

W

World Wide Web, Bay Networks home page on, xvii